

Claims

- [c1] A method to automatically create a three-dimensional nail object, comprising:
 - starting with a three-dimensional array of data representing a digitized nail surface, and;
 - measuring key reference points along the tip of the nail surface along the X-axis, Y-axis, Z-axis and the periphery of the tip of the digitized nail surface, and;
 - Selecting a preexisting nail tip three-dimensional point array that closely matches the key reference points; and
 - duplicating the digitized nail surface area and raising the duplicate surface area on the Z-axis to align with the top value of the selected nail tip, and;
 - combining the nail tip, the duplicated nail surface and the digitized nail surface into a new preferred three-dimensional artificial nail object that conforms to an expected result so that the new generated nail object will fit over the digitized nail surface and create a desired artificial nail appearance.
- [c2] The method of Claim 1, wherein starting with a three-dimensional array of data representing a digitized nail surface includes any data that can be used to represent a

three-dimensional object.

- [c3] The method of Claim 1, wherein the three-dimensional array of data may be represented as points of data representing an X-axis, Y-axis and Z-axis. The three-dimensional array of data may also include the points defining the periphery of the tip of the digitized nail surface.
- [c4] The method of Claim 1, wherein measuring key reference points includes determining the measurement value in millimeters or inches of the nail surface along its X-axis, Y-axis and Z-axis; where X-axis represents width, Y-axis represents the length and Z-axis represents depth.
- [c5] The method of Claim 1, wherein measuring key reference points includes determining the arc of the digitized nail surface along the X-axis and/or determining the arc of the nail surface along the Y-axis.
- [c6] The method of Claim 1, wherein measuring key reference points includes evaluating three-dimensional points along the periphery of the tip of the nail surface.
- [c7] The method of Claim 1, wherein selecting a preexisting three-dimensional array of points resembling a preferred nail tip includes using the reference points to select and modify various nail tip objects that have been previously

created which closely resemble a desired artificial nail tip.

- [c8] The method of Claim 1, wherein the duplicating of a digitized nail surface includes replicating the three-dimensional points of the digitized nail surface and manipulating those points on the Z-axis to gain a desired thickness to the final customized nail object. This replicated array of points will become part of the top surface of the customized nail object.
- [c9] The method of Claim 8, wherein the duplicated copy of three-dimensional points may require a smoothing function in order for the top surface of the customized nail object to have a uniform and smooth appearance. Smoothing is achieved by comparing all of the three-dimensional points to three-dimensional points next to each point and using a range parameter to determine if the point is out of sync with the desired smoothing function.
- [c10] The method of Claim 1, wherein the combination of the duplicated nail surface, the selected tip and the digitized nail surface includes aligning the selecting tip to the duplicated nail surface to form the top of the customized nail object and then aligning the digitized nail surface to the other objects to form the customized fit and bottom

of the customized nail object.

- [c11] The method of Claim 1, wherein the desired nail object in its final state is a customized three-dimensional object representing an artificial nail that is desired, which fits over the digitized nail surface.
- [c12] A process to automatically create a three-dimensional nail object, comprising:
 - starting with a three-dimensional array of data representing a digitized nail surface, and;
 - measuring key reference points along the tip of the nail surface along the X-axis, Y-axis, Z-axis and the periphery of the tip of the digitized nail surface, and;
 - Selecting a preexisting nail tip three-dimensional point array that closely matches the key reference points; and
 - duplicating the digitized nail surface area and raising the duplicate surface area on the Z-axis to align with the top value of the selected nail tip, and;
 - combining the nail tip, the duplicated nail surface and the digitized nail surface into a new preferred three-dimensional artificial nail object that conforms to an expected result so that the new generated nail object will fit over the digitized nail surface and create a desired artificial nail appearance.
- [c13] The process of Claim 12, wherein starting with a three-

dimensional array of data representing a digitized nail surface includes any data that can be used to represent a three-dimensional object.

- [c14] The process of Claim 12, wherein the three-dimensional array of data may be represented as points of data representing an X-axis, Y-axis and Z-axis. The three-dimensional array of data may also include the points defining the periphery of the tip of the digitized nail surface.
- [c15] The process of Claim 12, wherein measuring key reference points includes determining the measurement value in millimeters or inches of the nail surface along its X-axis, Y-axis and Z-axis; where X-axis represents width, Y-axis represents the length and Z-axis represents depth.
- [c16] The process of Claim 12, wherein measuring key reference points includes determining the arc of the digitized nail surface along the X-axis and/or determining the arc of the nail surface along the Y-axis.
- [c17] The process of Claim 12, wherein measuring key reference points includes evaluating three-dimensional points along the periphery of the tip of the nail surface.
- [c18] The process of Claim 12, wherein selecting a preexisting

three-dimensional array of points resembling a preferred nail tip includes using the reference points to select and modify various nail tip objects that have been previously created which closely resemble a desired artificial nail tip.

- [c19] The process of Claim 12, wherein the duplicating of a digitized nail surface includes replicating the three-dimensional points of the digitized nail surface and manipulating those points on the Z-axis to gain a desired thickness to the final customized nail object. This replicated array of points will become part of the top surface of the customized nail object.
- [c20] The process of Claim 19, wherein the duplicated copy of three-dimensional points may require a smoothing function in order for the top surface of the customized nail object to have a uniform and smooth appearance. Smoothing is achieved by comparing all of the three-dimensional points to three-dimensional points next to each point and using a range parameter to determine if the point is out of sync with the desired smoothing function.
- [c21] The process of Claim 12, wherein the combination of the duplicated nail surface, the selected tip and the digitized nail surface includes aligning the selecting tip to the du-

plicated nail surface to form the top of the customized nail object and then aligning the digitized nail surface to the other objects to form the customized fit and bottom of the customized nail object.

- [c22] The process of Claim 12, wherein the desired nail object in its final state is a customized three-dimensional object representing an artificial nail that is desired, which fits over the digitized nail surface.
- [c23] A computer program to automatically create a three-dimensional nail object, comprising:
 - starting with a three-dimensional array of data representing a digitized nail surface, and;
 - measuring key reference points along the tip of the nail surface along the X-axis, Y-axis, Z-axis and the periphery of the tip of the digitized nail surface, and;
 - Selecting a preexisting nail tip three-dimensional point array that closely matches the key reference points; and
 - duplicating the digitized nail surface area and raising the duplicate surface area on the Z-axis to align with the top value of the selected nail tip, and;
 - combining the nail tip, the duplicated nail surface and the digitized nail surface into a new preferred three-dimensional artificial nail object that conforms to an expected result so that the new generated nail object will fit over the digitized nail surface and create a desired ar-

tificial nail appearance.

- [c24] The computer program of Claim 23, wherein starting with a three-dimensional array of data representing a digitized nail surface includes any data that can be used to represent a three-dimensional object.
- [c25] The computer program of Claim 23, wherein the three-dimensional array of data may be represented as points of data representing an X-axis, Y-axis and Z-axis. The three-dimensional array of data may also include the points defining the periphery of the tip of the digitized nail surface.
- [c26] The computer program of Claim 23, wherein measuring key reference points includes determining the measurement value in millimeters or inches of the nail surface along its X-axis, Y-axis and Z-axis; where X-axis represents width, Y-axis represents the length and Z-axis represents depth.
- [c27] The computer program of Claim 23, wherein measuring key reference points includes determining the arc of the digitized nail surface along the X-axis and/or determining the arc of the nail surface along the Y-axis.
- [c28] The computer program of Claim 23, wherein measuring key reference points includes evaluating three-di-

dimensional points along the periphery of the tip of the nail surface.

- [c29] The computer program of Claim 23, wherein selecting a preexisting three-dimensional array of points resembling a preferred nail tip includes using the reference points to select and modify various nail tip objects that have been previously created which closely resemble a desired artificial nail tip.
- [c30] The computer program of Claim 23, wherein the duplicating of a digitized nail surface includes replicating the three-dimensional points of the digitized nail surface and manipulating those points on the Z-axis to gain a desired thickness to the final customized nail object. This replicated array of points will become part of the top surface of the customized nail object.
- [c31] The computer program of Claim 30, wherein the duplicated copy of three-dimensional points may require a smoothing function in order for the top surface of the customized nail object to have a uniform and smooth appearance. Smoothing is achieved by comparing all of the three-dimensional points to three-dimensional points next to each point and using a range parameter to determine if the point is out of sync with the desired smoothing function.

- [c32] The computer program of Claim 23, wherein the combination of the duplicated nail surface, the selected tip and the digitized nail surface includes aligning the selecting tip to the duplicated nail surface to form the top of the customized nail object and then aligning the digitized nail surface to the other objects to form the customized fit and bottom of the customized nail object.
- [c33] The computer program of Claim 23, wherein the desired nail object in its final state is a customized three-dimensional object representing an artificial nail that is desired, which fits over the digitized nail surface.